

# ADO THE ULTIMATE IN DIGITAL SPECIAL EFFECTS

ADO 2000/3000



**AMPEX**



# ADO.<sup>®</sup> THE WORLD'S MOST POPULAR DIGITAL EFFECTS SYSTEM.

**N**O TOOLS HAVE HAD as much impact on video production as the ADO family of digital effects systems.

A recent survey in a leading post production magazine asked producers what equipment they look for first in a video facility.

"The results, while not surprising, give a very concrete picture of producer preference. The Ampex ADO...dominates the field."

Its popularity and legendary performance have made the ADO name a synonym for outstanding video effects.

So if you're thinking about an ADO system for your facility, you'll be in good company.

**There are over 2000 ADO systems in use around the world** You'll find an ADO system at nearly every broadcast network and major production facility.

## **Why is the ADO system so popular?**

Because of the long list of innovative effects you can create. And that list is continually growing.

ADO is an expandable system. It is designed to accept upgrades and improvements as they're developed.

And no one has introduced more significant upgrades and improvements in digital effects than Ampex.

There's a team of engineers at Ampex dedicated to developing ADO improvements. They're responsible for upgrades like the Digi-Matte,<sup>™</sup> Digi-Trail,<sup>™</sup> 3D Keyer and Infinity<sup>™</sup> packages.

## **Compare the signal performance to any other effects system**

It's another reason the system is so popular. Proprietary filtering and processing techniques provide the cleanest picture in the industry.

Perspective and rotation are realistic, even at slow speeds.

Transitions are smooth and free of glitches. And controllable soft key edges eliminate jagged edges and that "pasted-on" look.



**With the Digi-Trail option, multi-freeze effects like drop shadows are easy, even on one channel systems.**

The signal is so transparent, ADO devices have become a popular tool for "touching up" or repositioning video.

## **Computing power makes the difference**

Superior computing power means you get a cleaner picture, more convincing motion, and more *control* over your effects than any other system can provide.

ADO processors perform 526 *million* computations a second using 64-bit numbers. It handles the work, so you can concentrate on the creative.

## **Which ADO system for you?**

It depends on your application. All systems can expand in capability, but there are two basic models:

The ADO 3000 model is the premier effects system for post production.

The ADO 2000 model combines the signal quality of the 3000 with a package of features and effects designed for ease of operation, making it a cost effective tool for facilities that demand sophisticated effects on a limited budget.

## **What if your needs change?** No problem.

Through upgrades a single channel ADO 2000 system can grow into a full-blown multi-channel ADO 3000 system with Infinity.

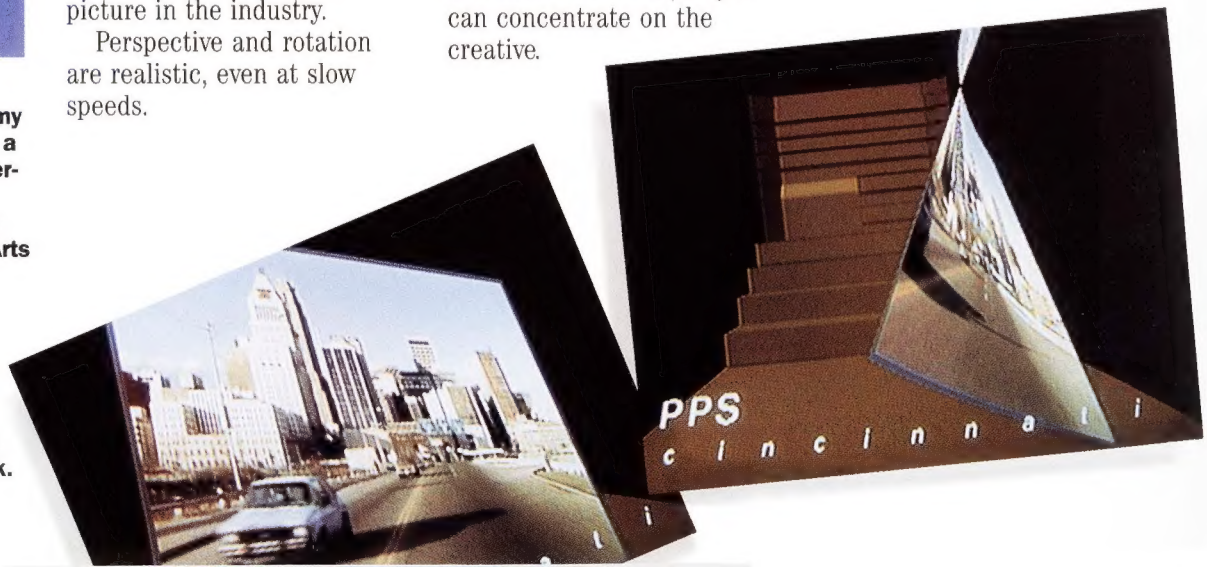
You can pace your system's growth to your needs and your budget. And you can install all ADO options and upgrades right in your own facility.

Trademark NATAS/ATAS



**ADO awards include an Emmy for engineering excellence, a Monitor Award from the International Teleproduction Society, and a citation from the Academy of Television Arts and Sciences.**

**With an ADO system, you can do on-air warps without the "canned" look.**







### The Bottom Line

You probably couldn't make a better equipment investment.

In broadcast, the ADO "look" helps improve ratings and attract advertisers.

In production, an ADO system helps you compete for customers.

And in corporate video, ADO effects add a professional look that holds your viewers' attention.

ADO devices are designed to interface easily with

Ampex and other manufacturers' equipment. So you're up and running with a minimum of installation problems.

It's easy to learn, too. With the unique, self-paced training package, operators can be in production in a matter of hours.

And Ampex support helps you get the most out of your ADO system, whichever one you choose.

### Service and support that's unmatched in the industry

We know the way to build business is through customer support. And if you ask around, you'll find no one has a worldwide service and support network like ours.

Expert field service, careful documentation, phone-in technical support, an innovative parts program, and operator and maintenance training all help ensure

that your Ampex equipment provides peak performance.

**A comprehensive display provides complete key frame data for all your effects. Programming "by the numbers" is simple and straightforward. And all effect parameters can be easily controlled by the joystick.**





# UPGRADABILITY, EASY SYSTEM INTEGRATION AND A SIMPLE-TO-USE CONTROL SYSTEM THAT PUTS *YOU* IN CHARGE OF THE EFFECTS.

**U**PGRADABILITY. IT simply means your ADO system will grow with you as your needs change.

It means you won't have to sacrifice quality along the way.

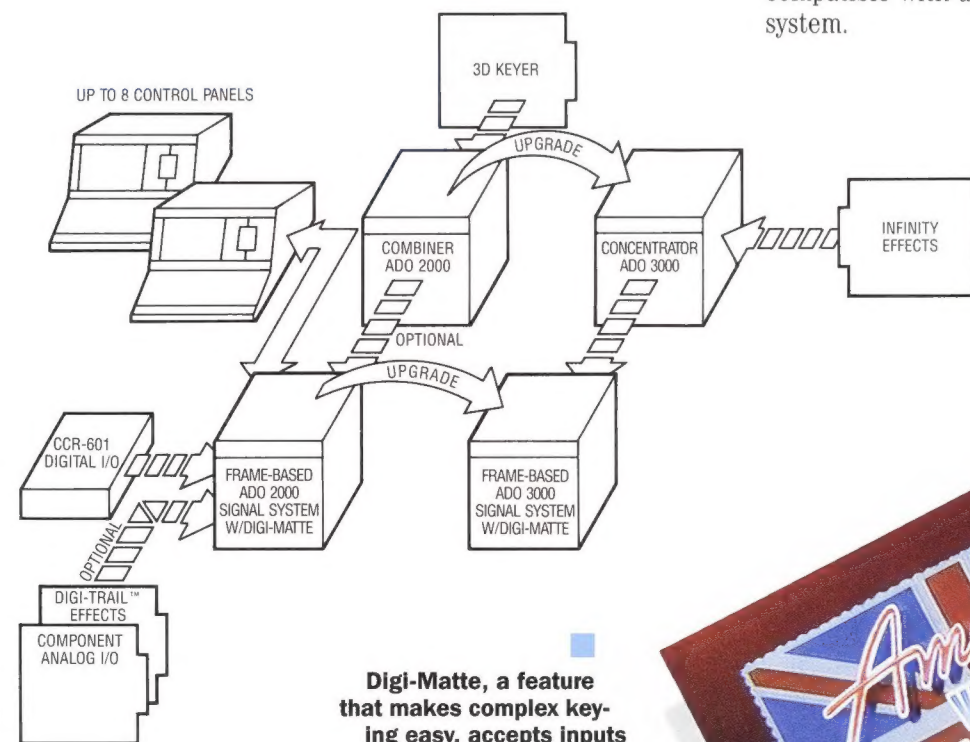
And it means you won't be saddled with obsolete equipment.

So when you choose any ADO model, you've chosen a system that will *protect* your investment—with the widest range of solutions for a changing world.



No other manufacturer offers a training package as logical and comprehensive. Audio and video cassettes lead you through the effects process step-by-step at your own pace.

**The upgrade Path.** Start with an ADO 2000 and add channels, options and capability as your needs grow. Your ADO 2000 system can grow to become a 3000, and all modifications can be done right in your own facility.



**Digi-Matte, a feature that makes complex keying easy, accepts inputs that are out-of-time. So equipment interface and timing problems are virtually eliminated.**

## The upgrade path

Start with a single channel of ADO 2000. As you grow you'll probably want to add powerful enhancements like the Digi-Trail target frame-store. Later, a second channel with Combiner can be added, and the Combiner's 3D Keyer option.

Or, start with an ADO 3000 and you can add a Concentrator and the incredible Infinity package.

At any point you can add extra channels (up to four) and extra control panels (up to eight).

And *all* modifications can be done right in your own facility.

## ADO is a team player

You don't have to design your entire system *around* your ADO unit. It's built to be an integral part of your *existing* production system.

Timing is easy, so you can integrate any ADO model without a lot of custom work.

A GPI control input is provided for simple effect execution from other devices.

And every ADO system features a universal serial editor port that lets you fully control your effects from serial editing systems like the Ampex ACE.

Ampex has made the RS 422 protocol available to other editor manufacturers, as well as customers who write their own interfaces.

## Control through your Ampex switcher

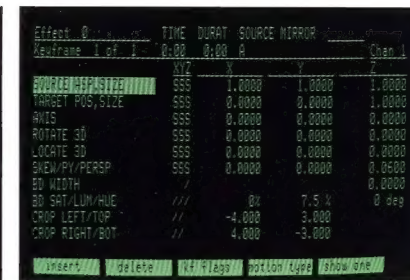
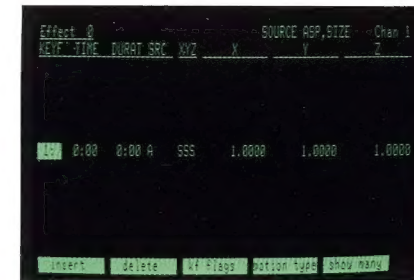
An ADO/AVC interface is available that lets you recall and run effects directly from any AVC, Century, or Vista series Ampex switcher.

This makes ADO systems especially versatile for live broadcast. Since an operator has only one control panel to worry about, there's less possibility for on-air mistakes.

## Inputs/outputs available for all signal standards

The standard ADO system is equipped with composite inputs and outputs. With options, the same system will operate in the RGB, Component Analog or CCIR-601 (4:2:2) component digital domain.

So no matter what happens with formats, you'll be compatible with an ADO system.



The ADO display provides all the parameters for a given keyframe (left), or a single parameter across all keyframes (far left).

## Planning on time-sharing your effects system?

Better plan on an ADO system.

Timing adjustments for all ADO signal systems are stored at each control panel. And any panel can access any signal system.

As a signal system is acquired, it is automatically timed using the set-up parameters of that control panel.

So operators can easily retime a system themselves—without a time-consuming trip to the machine room for system reconfiguration.

## Learning to run an ADO system is easy

Documentation is clear, menus are easy to understand, and no effects system manufacturer offers a training package as logical and comprehensive.

It includes audio and video cassettes that lead you through the effects process—step-by-step.

So you learn—in your own facility, at your own pace—how to get the most out of your new system.

## Programming features let you concentrate on creativity, rather than keystrokes

All ADO models are designed to be easy for new users. But as you gain experience, you'll begin to appreciate the software shortcuts provided to simplify the creation of complex effects.

*Global Motion Control* provides an easy way to program the motion path of a cube or other solid.

It lets you program the position of the viewpoint rather than the individual faces of the solid—so you have only one set of parameters to manage, rather than several.

*Auto Cube* makes rotating cube effects fast and simple. Since opposite faces of the cube are created on a single channel, VTR passes are cut in half.

The ADO 2000 system gives you instant access to 30 of your effects with a single keystroke. So even new operators can run sophisticated effects, on-air, without foul-ups.

## Superior computing power gives you more flexibility and control

The superior computing power of an ADO system becomes obvious when you compare its flexibility and *control* to other systems.

You can monitor keyframe information in two ways. "Show One" mode displays *one parameter* for *all* keyframes. "Show Many" mode displays *all parameters* and their values for a *single* keyframe.

Between the two, you get an intuitive grasp of how your effect is shaping up.

Programming "by-the-numbers" is easy and straightforward, too. If you want a picture twice normal size, simply enter "2."

Compare this to other systems that use obscure decimal conversions of binary numbers for simple commands.

## You control the effects within the effect

Many systems won't let you modify critical variables, like

motion types or mosaics, during an effect.

ADO systems do. They provide keyframe flags—"switches" that can turn virtually any variable on or off at any point during an effect.

This gives you more creative control, and the ability to avoid that "canned" look.

## Finally, a logical way to catalog and recall effects

Try shuffling through your old disks to find an effect that's been stored away under some random numbering system. It's virtually impossible!

You put a lot of work into your effects. If you can't find them, that work is wasted.

An ADO system lets you store your effects by number—and by *name*.

This eliminates confusion and makes effect recall fast and accurate, especially in the heat of live production.

And, with the Off-Line Effects Management System, you can handle all your file management, archiving and library functions on a standard IBM PC.





# ADO EFFECTS HAVE HELPED IMAGINATIVE PRODUCERS WIN COUNTLESS AWARDS FOR PRODUCTION EXCELLENCE.

**W**HETHER YOU'RE IN commercial production, live news or corporate video, ADO effects can add more sparkle and imagination to *your* work. An effects system is a creative tool. If you have the talent to do award-winning work, shouldn't you have the best tools available?

**Digi-Matte™ key processor.**  
The easy way to create detailed key effects  
The Digi-Matte feature, standard on all models, lets you create "flying logo" key effects — without the expense of a second channel, or the hassles of matte reels. It provides a separate dedicated key input for manipulating key signals

**The Digi-Trail™ Target Framestore option for ADO 2000**  
The Digi-Trail target framestore lets you add trails and sparkles to moving images and "smear" motion with moving video. Its unique "layering mode" makes multi-layered graphic composition faster and easier than ever.

surface of the plane. While other systems lock you into canned moves, the ADO systems offer the potential for much more innovation.

**Mosaics, posterization and other effects**  
Mosaics, posterization, solarization, luma reversal, chromakill; all are standard features on the ADO systems. And since the processing is done on the ADO input, they can all be positioned in 3D space.

These input processing features are highly adjustable, too. They can be transitioned smoothly, turned on and off independently, or used on only part of the screen — or for only part of the transition.

On the ADO systems *you* make the choices, *you* have the creative control.

This means a picture that's been "mosaiced" can also be compressed and put into perspective.

With the ADO system you can create multifaceted images easily, then fly them around — or fly through them, with Global Motion Control.



■ The Digi-Matte feature gives you the ability to build realistic key effects, without a second channel or matte reels.

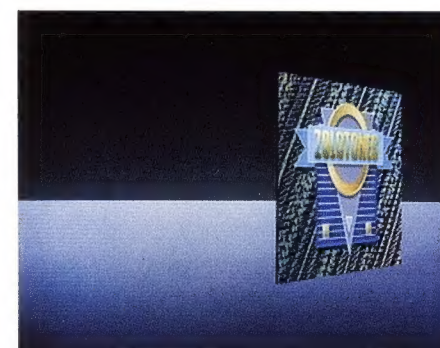
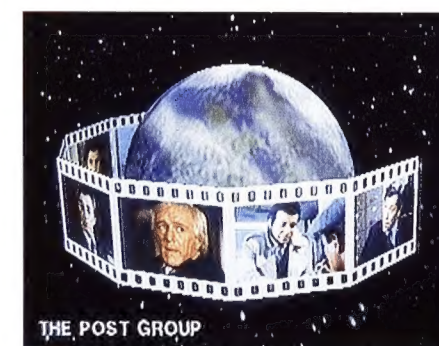
alongside the primary video signals. The Digi-Matte key output can be precisely lined up with your video output for keying.

Full 8-bit resolution means detailed key inputs, and the gray values required for linear keying are faithfully reproduced. And soft edges stay soft, so you never get that "pasted-on" look.

The Digi-Matte processor will even accept inputs that are *out-of-time* with respect to video inputs. So interface problems with your other equipment are virtually eliminated.

And the Digi-Trail option lets you create 3D shapes, frozen drop shadows and complex multi-freeze effects with only *one* channel.

**Warps, without the "canned" look**  
ADO warps are the warps producers ask for. It's because of the high degree of variability possible with the motion. The swirling shapes an ADO system produces actually appear to leave the



■ The Digi-Trail target framestore option has a unique "layering mode" that makes building multi-level graphics easier.



# WHICH ADO SYSTEM FOR YOU?



The ADO 2000 system delivers award-winning effects, on a budget. Upgrades like Digi-Trail and the 3D Keyer can be added as you grow.

ADO 2000 AND 3000 share many of the same features; (you'll find them covered in detail in the accompanying materials). But there are also some significant differences. The right ADO model depends on your application. One way to find out is by calling your Ampex Sales Engineer. We're available to answer your questions.

**The ADO 2000: Frame-based signal processing in a cost-effective package**  
So you want all the creative capability and customer-drawing appeal of an ADO system, but don't think you can afford it? Think again.

FRAME vs. FIELD-BASED PROCESSING	
<b>Frame-based processing:</b> As a picture is manipulated, the system uses the full 525 lines of information to determine the output image.	
<b>Pros:</b> Very high vertical resolution for non-moving images.	<b>Cons:</b> With moving video, interfield flicker is "frozen" into output and can result in a double image.
<b>Field-based processing:</b> The system uses only a field's worth of lines as source data. The other 262 lines required for calculations are synthesized by the system.	
<b>Pros:</b> Double images around areas of motion are eliminated.	<b>Cons:</b> Resolution is reduced in the vertical direction.

**The best of both worlds**  
Both the ADO 2000 and 3000 models are true frame-based systems, but will switch to field-based processing if required by the image's motion. A sophisticated pixel-by-pixel motion detection scheme determines which type of processing is most appropriate for a given image.

The ADO 2000 model is designed for broadcast and production facilities that want award-winning effects — on a budget. The ADO 2000 model combines frame-based processing with the unique ADO architecture and filtering to deliver the finest picture in the industry — at a price within your reach. The 2000 model provides the same superior picture quality the ADO 3000 system provides — the picture quality post production customers demand.

There are also some features on-air producers will really appreciate. Since the ADO 2000 stores 30 pre-programmed effects for instant recall, it's ideal for on-air use. And with upgrades like Digi-Trail and the 3D Keyer, it can be a great production tool.

Operators can build their own effects, then store them on inexpensive floppy disks for use on-air. With a single key stroke, even a novice operator can then incorporate these zooms, flips, tumbles and trails into your live programming.

**The ADO Combiner digitally combines signals from multiple channels.**  
An option for ADO 2000 models, the Combiner is available for either two or four-channel systems. It digitally

combines channels, then routes a single output back to your switcher, so only one keyer is used. Channel priorities can be set either manually, or automatically positioned properly in 3D space. This is a real time-saver when you're building tricky effects.



With the ADO 2000, operators can incorporate zooms, flips and tumbles into live programming with a single keystroke.

**The 3D Keyer Option, for intersecting planes**  
The 3D Keyer option for the ADO 2000 Combiner enables you to pass planes, frames and solids — and Digi-Matte key signals — through each other, while the full range of other ADO effects is simultaneously incorporated into each channel's separate image. Available in two and four channel configurations, it lets you create real-time intersection of multiple ADO image planes, and manipulate your creation in the same way ADO lets you manipulate standard ADO video.

**The ADO 3000: The post production tool producers ask for first**  
When it comes to drawing customers into a facility, an ADO system works harder than any other piece of equipment.

A major trade magazine calls the ADO system a post production "buzzword." And for good reason. An ADO 3000 system is simply the most spectacular and versatile creative tool a facility could have.

It combines superior features and picture quality with optional capability and effects that no other system can match.

**The Concentrator: digitally combines channels for the ADO 3000 system**  
A Concentrator digitally combines and prioritizes multiple channels like the ADO Combiner, but with some important additional features.

Transparency/opacity of each channel is independently variable while a programmable light source adds an illusion of depth to your effects. With its ability to do unity gain linear keys and digital dissolves, the Concentrator functions like a digital switcher — providing super clean keys, especially with graphics.

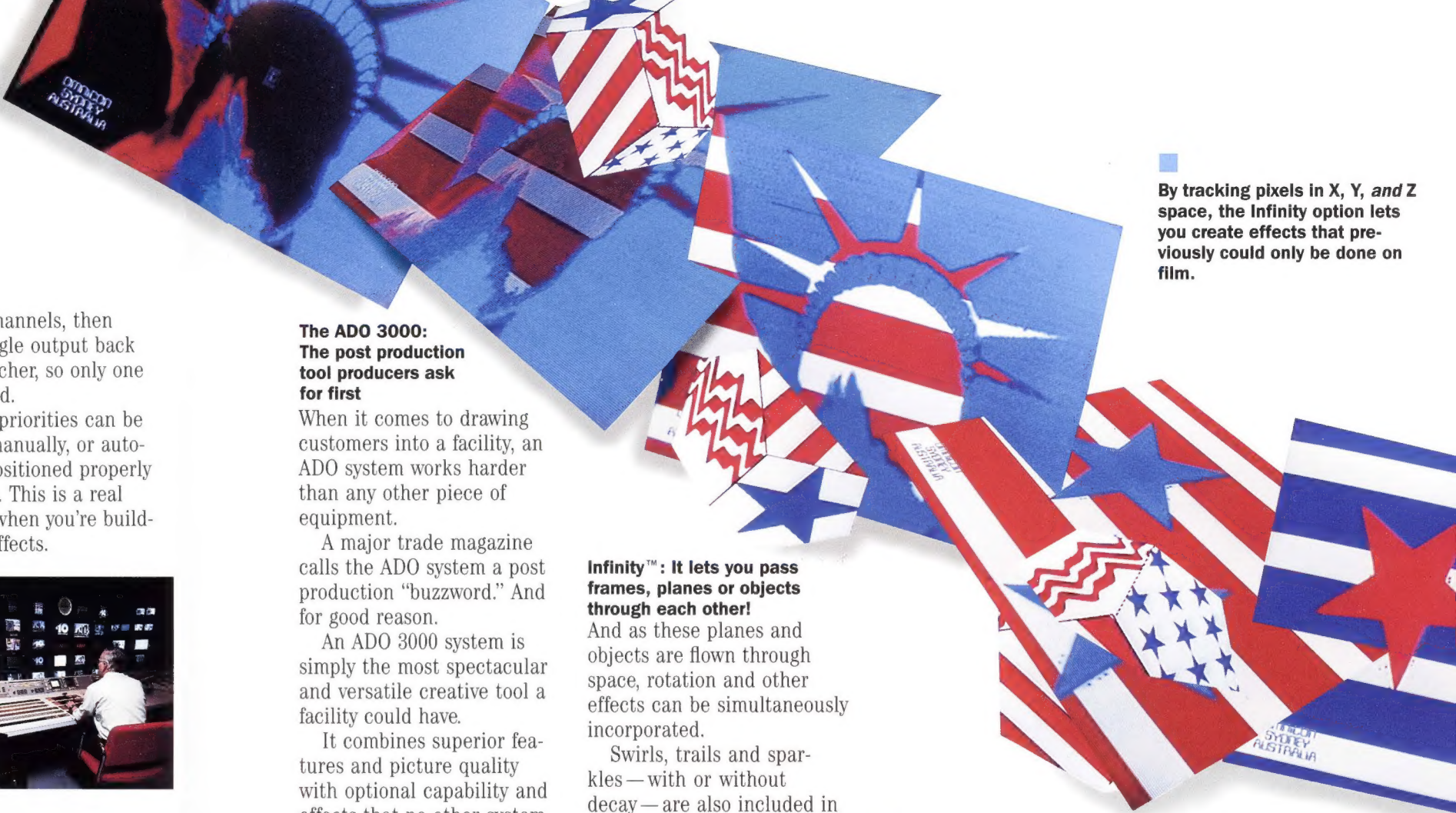
**Infinity™: It lets you pass frames, planes or objects through each other!**  
And as these planes and objects are flown through space, rotation and other effects can be simultaneously incorporated. Swirls, trails and sparkles — with or without decay — are also included in the package.

By keeping track of all pixels in X, Y and Z space, the Infinity option is able to do effects that previously could only be done on film — optical effects that draw production customers, and give your station a sophisticated on-air "look."

Which ADO system for you? Compare their features, then call your Ampex Sales Engineer or Authorized Ampex Dealer for details.

SYSTEM BASICS	ADO 2000	ADO 3000
Frame-based processing	X	X
30 on-line effects	X	
Digi-Matte key processor	X	X
Digi-Trail Option	O	
Combiner Interface	X	
3D Keyer Option for Combiner	O	
Concentrator Interface		X
Infinity Option for Concentrator		O

X = Standard    O = Option



By tracking pixels in X, Y, and Z space, the Infinity option lets you create effects that previously could only be done on film.



# ADO ENGINEERING: BASICALLY BETTER TO BEGIN WITH.

## 8-Point digital filtering

Because of the standard sampling rates, most modern digital effects devices work within a grid of pixels 720 wide by 484 high (576 PAL).

But believable motion and true perspective require the movement of a picture in increments of *less* than one pixel.

To accomplish this, an effects system must filter and interpolate *intermediate* values across the grid. Many systems don't know how.

ADO processing determines these intermediate values through *8-point filtering*.

8-point filtering means the system looks at 8 points to the left and right of a location. Using such precise filtering, 32 intermediate values between horizontal pixel locations can be accurately interpolated.

Meanwhile ADO processors are simultaneously doing the same 8-point filtering and interpolation in the vertical direction.

The resulting 64-point spatial filtering results in positional resolution of 1/32nd pixel (about 2 nanoseconds) horizontally and vertically — and a much more convincing effect.

## Separable architecture

Separable architecture — the separate handling of horizontal and vertical filtering — plays a major part in making ADO effects so much more realistic than other systems.

Ampex's patented separable architecture allows ADO systems to do the sophisticated processing and provide the superior resolution that puts ADO effects in a class by themselves.

## "Adaptive" comb filtering

A comb filter improves horizontal resolution, but at the expense of artifacts near vertical transitions.

Adaptive filtering means the system can selectively turn its comb filter on or off. This helps avoid vertical problems. And helps the system deliver a much cleaner picture.

## Chroma signal predecimation

ADO processing "prefilters" the chroma channels with several preset filters early in the processing path.

This predecimation acts as a "coarse adjust," so the full power of the ADO filtering process can be used for "fine adjust."

## ADO: a continuing evolution

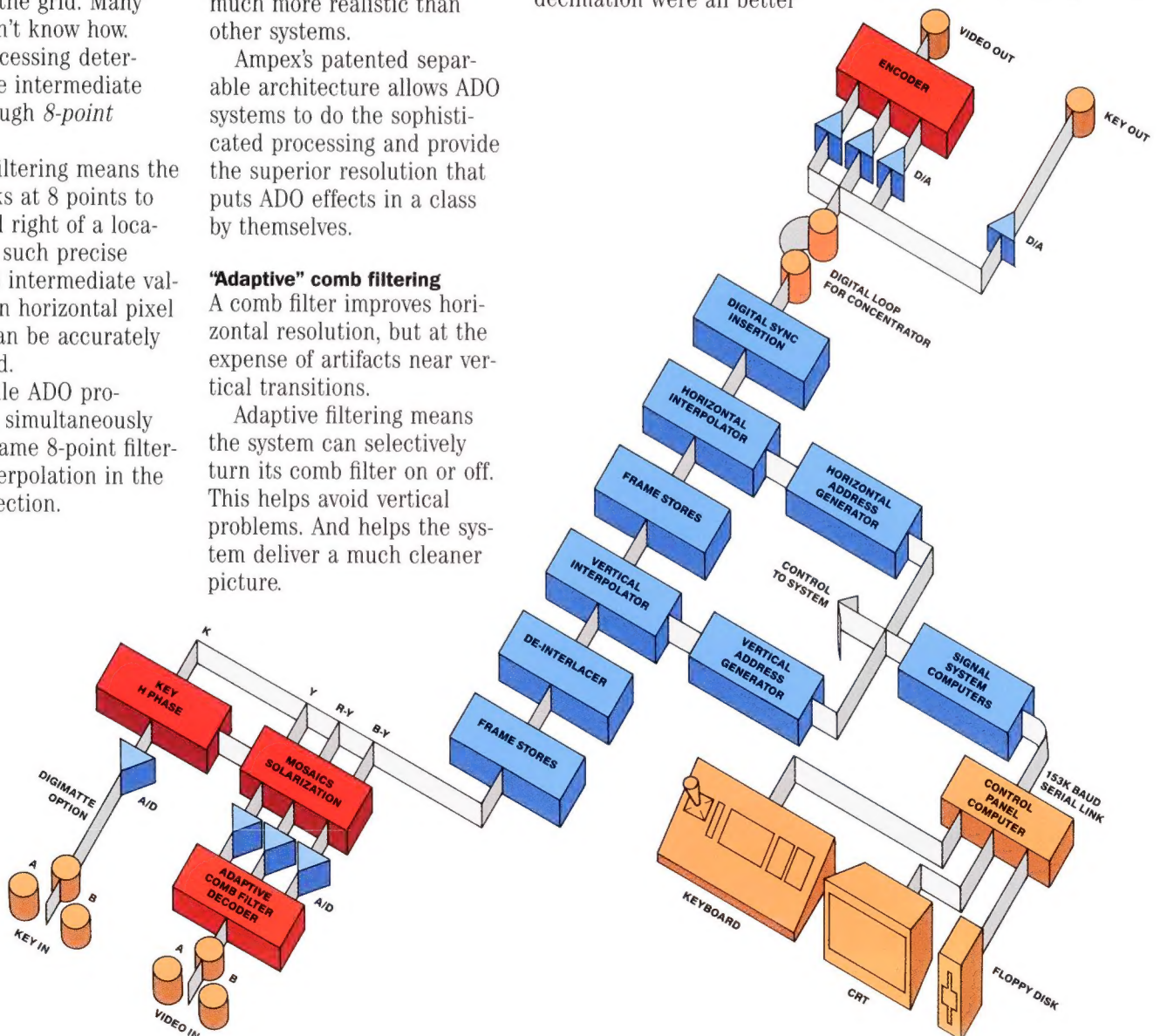
Separable architecture, 8-point filtering, and predecimation were all better

ideas to begin with. And we've been improving our technology since the day the first ADO system was introduced.

Compare. With each ADO model you get the most comprehensive control of any effects system, built around the cleanest signal processing in the industry.

Get hold of an ADO demo reel and take a look.

The proof is in the pictures.





# ADO<sup>TM</sup> 2000 DIGITAL EFFECTS SYSTEM

## General

Designed for broadcast and production facilities, the ADO 2000 digital effects system provides the finest picture quality comparable to top-of-the-line systems and an array of features tailored to live production requirements.

The system can be expanded to include up to four channels and eight control panels. And by following an upgrade path, powerful options like the Digi-Trail<sup>TM</sup> target framestore can be added to give your system capabilities unmatched by any other effects device.

The ADO 2000 system can even be converted into an ADO 3000 system, with options like the Concentrator with the incredible Infinity<sup>TM</sup> package. And all options and upgrades can be installed in your own facility.

The basic ADO 2000 system provides instant access to 30 on-line, pre-programmed effects that can be incorporated into live programming with one or two keystrokes.

More versatile than a "shot-box," this feature allows you to:

- ☐ Run effects forward and backward
- ☐ Slew from any present picture location to the beginning of any effect
- ☐ Specify 10 position effects in 3D space, and choose different types of transitions to reach those positions
- ☐ "Trim" each effect as a minor adjustment for X and Y position, and/or size

The ADO 2000 system is designed to be an integral part of a complete production facility, so it interfaces easily with your existing equipment.

Input and output options are available for all signal standards, including Component Analog and CCIR-601 Digital.

A SMPTE RS-422 serial editor port lets you run effects from the control panel of serial editors like the Ampex ACE. And an ADO/AVC

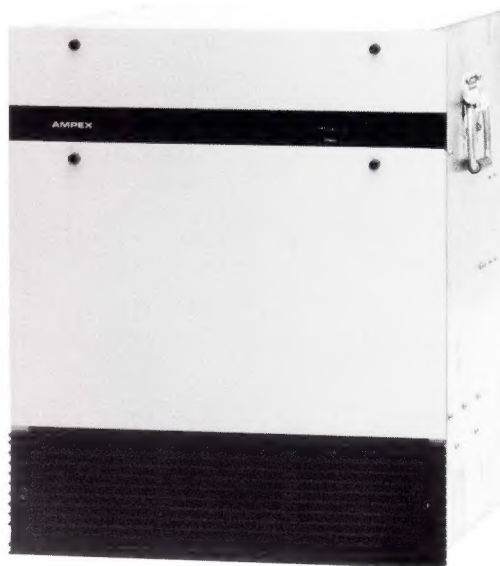
interface is available for live, error-free effects control from your Ampex switcher.

Effect parameters can be displayed in two ways: *all* the parameters for a given keyframe, or a *single* parameter across *all* keyframes.

Versatile "keyframe flags" act as switches; they can turn any variable within an effect on or off at any time during the effect.

Cataloging effects can be by either number or name for fast, accurate recall.

The system's frame-based processing and unique engineering features like separable architecture, eight-point digital filtering, 64-point spatial interpolation, adaptive comb filtering and chroma signal pre-decimation all combine to provide the finest picture quality in the industry.





## Features and Effects

- ☐ Frame-Based Processing for Highest Possible Performance
- ☐ True 3D Rotation and Perspective
- ☐ Digi-Matte™ Key Processing
- ☐ 30 On-line Effects with One or Two Button Execution
- ☐ A/B Video Inputs
- ☐ Continuously Variable Compression and Expansion
- ☐ Variable Aspect Ratio
- ☐ Horizontal and Vertical Mirrors
- ☐ GPI Control Input
- ☐ Independent Picture and Key Cropping
- ☐ Highly Adjustable Mosaics
- ☐ Posterization and Solarization
- ☐ Luma and Chroma Reversal
- ☐ Picture Blur
- ☐ Field or Frame Freeze
- ☐ Adjustable Soft Key Border Edges
- ☐ Color Border Generator
- ☐ Multi-Panel, Multi-Channel Software
- ☐ Logical Keyframe Programming
- ☐ Straightforward Numerical Programming
- ☐ Comprehensive CRT Display
- ☐ Channel Identification
- ☐ Global Motion Control
- ☐ Auto Cube Mode
- ☐ Selectable Motion Types
- ☐ Forward/Reverse Run Modes
- ☐ Alphanumeric Effect Storage
- ☐ Disk Copy Function
- ☐ Serial Switcher Interface
- ☐ Serial Editor Interface

## Optional Features and Effects

- ☐ Digi-Trail™ Target Framestore
- ☐ Component Analog (RGB, YUV) Kit
- ☐ SMPTE/EBU CCIR-601 (4:2:2) Digital Interface
- ☐ Up to Eight Control Panels
- ☐ Up to Four Signal Systems
- ☐ Digital Combiner
- ☐ 3D Keyer

## Specifications

### PERFORMANCE

Luminance frequency response: NTSC  $\pm 0.5$  dB to 4.2 MHz; +0.5 – 1.0 dB to 5.0 MHz  
PAL  $\pm 0.5$  dB to 4.5 MHz; +0.5 – dB to 5.0 MHz

Input video level range: +2 dB

### DIGITAL SIGNAL SAMPLING

Luminance sampling rate: 13.5 MHz

### SIGNAL SYSTEM INTERCONNECTS

Video Inputs: Two, BNC 75 Ohm, 1 Volt, Composite, Analog Encoded  
Key Inputs: Two, BNC 75 Ohm, Composite or Non-Composite, Analog Encoded (white or black in key hole)  
Video Outputs: Two, BNC 75 Ohm, 1 Volt, Composite, Analog Encoded  
Digital Signal Data: To Combiner: Balanced ECL Digital Data, 15 feet max, multi-wire cable supplied with Concentrator  
Digital Control Data: RS-422, 4-wire plus shield, 9-pin 'D' Connector Communication line. Remotable 2000 ft. (600 meters between control panel and signal system)

### CONTROL SYSTEM

Detachable keyboard with 3-axis joystick      Remote data display output (non-synchronous)  
9-inch CRT for data display      GPI Trigger Input  
Mini-floppy disk drive for effect archiving      Serial Control — ACE Interface

### POWER CONSUMPTION

110-120 VAC, 60 Hz or 220-240, 50 Hz — single phase

Signal System: 1400W

Control System: 100 W

### PHYSICAL

#### Signal System Chassis:

Dimensions: 22.72" (58 cm) H x 17.5" (44.5 cm) W x 22" (55.9 cm) D  
Weight: 200 lb (90 kg.)  
Can be mounted in 19" equipment rack or free-standing as a tabletop unit

#### Control System:

Monitor Housing contains 9" CRT and mini-floppy disk drive  
Dimensions: 11.75" (30 cm) H x 15.25" (39 cm) W x 14.5" (37 cm) D  
Weight: 30 lb (13.5 kg.)  
Keyboard:  
Dimensions: 3.25" (8 cm) H x 15.25" (39 cm) W x 7.75" (20 cm) D  
Weight: 8 lb (3.6 kg.)

Specifications subject to change without notice or obligation.

FOR INFORMATION ON AMPEX BROADCAST VIDEO PRODUCTS CONTACT THE VIDEO SALES MANAGER NEAREST YOU.

CALIFORNIA  
(415) 367-2202  
Redwood City  
(818) 365-8627  
San Fernando  
COLORADO  
(303) 279-1300  
Golden  
GEORGIA  
(404) 491-7112  
Atlanta

ILLINOIS  
(312) 593-6000  
Arlington Heights  
MARYLAND  
(301) 530-8800  
Bethesda  
MASSACHUSETTS  
(617) 932-6201  
Woburn  
NEW JERSEY  
(201) 825-9600  
Allendale  
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Mississauga, Ont.  
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Bogota

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Paris  
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Frankfurt (Main)  
HONG KONG  
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Kowloon  
ITALY  
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Rome

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Mexico, D.F.  
NETHERLANDS  
030-612921  
Utrecht  
SPAIN  
(91) 241-0919  
Madrid

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# AMPEX



# ADO<sup>TM</sup> 3000 DIGITAL EFFECTS SYSTEM

## General

The ADO 3000 digital effects system is the most versatile creative tool a post-production facility can have. It combines superior picture quality and ease-of-use with the award-winning effects your customers demand.

The system can be expanded to include up to four channels of video and eight control panels. Powerful options like the ADO Concentrator with the Infinity<sup>TM</sup> effects package can be added to give your system capability unmatched in the industry. And all options and upgrades can be installed at your own facility.

The ADO 3000 system is designed to be an integral part of a complete production facility, so it

interfaces easily with your existing equipment.

Input and output options are available for all signal standards, including Component analog and CCIR-601 digital formats. A SMPTE RS-422 serial editor port lets you run effects from the control panel of serial editors like the Ampex ACE<sup>TM</sup> editor. And the transparent picture quality makes the ADO 3000 system an ideal video "touch up" tool.

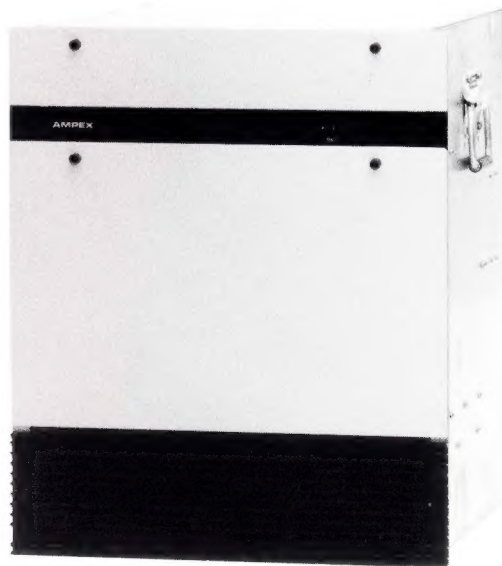
Superior computing power (up to 526 million computations per second) give the ADO 3000 model control flexibility unavailable on other systems.

Keyframe information can be monitored in two ways: *all* the

parameters for a given keyframe, or a single parameter across *all* the keyframes. This display gives you a comprehensive picture of your effects, and how they're created.

Versatile "keyframe flags" acts as switches; they can turn any variable within an effect on or off at any time during the effect.

The system's frame-based processing and unique engineering features like separable architecture, eight-point digital filtering, 64-point spatial interpolation, adaptive comb filtering and chroma signal pre-decimation all contribute to the finest picture quality in the industry.





## Features and Effects

- ☐ Frame-Based Processing for Highest Possible Performance
- ☐ A/B Video Inputs
- ☐ Continuously Variable Compression and Expansion
- ☐ True 3D Rotation and Perspective
- ☐ Digi-Matte™ Key Processing
- ☐ Variable Aspect Ratio
- ☐ Horizontal and Vertical Mirrors
- ☐ GPI Control Input
- ☐ Independent Picture and Key Cropping
- ☐ Highly Adjustable Mosaics
- ☐ Posterization and Solarization
- ☐ Luma and Chroma Reversal
- ☐ Picture Blur
- ☐ Field or Frame Freeze
- ☐ Adjustable Soft Key Border Edges
- ☐ Color Border Generator
- ☐ Multi-Panel, Multi-Channel Software
- ☐ Logical Keyframe Programming
- ☐ Straightforward Numerical Programming
- ☐ Comprehensive CRT Display
- ☐ Channel Identification
- ☐ Global Motion Control
- ☐ Auto Cube Mode
- ☐ Selectable Motion Types
- ☐ Forward/Reverse Run Modes
- ☐ Alphanumeric Effect Storage
- ☐ Disk Copy Function
- ☐ Serial Editor Interface

## Optional Features and Effects

- ☐ Digital Concentrator for Mixing/Keying in Digital Domain
- ☐ Infinity™ Special Effects Package for Concentrator
- ☐ Component Analog (RGB, YUV) Kit
- ☐ SMPTE/EBU CCIR-601 Digital Interface
- ☐ Up to Eight Control Panels
- ☐ Up to Four Signal Systems

## Specifications

### PERFORMANCE

Luminance frequency response: NTSC  $\pm 0.5$  dB to 4.2 MHz;  $+0.5 - 1.0$  dB to 5.0 MHz  
PAL  $\pm 0.5$  dB to 4.5 MHz;  $+0.5 -$  dB to 5.0 MHz

Input video level range:  $+2$  dB

### DIGITAL SIGNAL SAMPLING

Luminance sampling rate: 13.5 MHz

### SIGNAL SYSTEM INTERCONNECTS

Video Inputs: Two, BNC 75 Ohm, 1 Volt, Composite, Analog Encoded  
Key Inputs: Two, BNC 75 Ohm, Composite or Non-Composite, Analog Encoded (white or black in key hole)  
Video Outputs: Two, BNC 75 Ohm, 1 Volt, Composite, Analog Encoded  
Digital Signal Data: To Concentrator: Balanced ECL Digital Data, 15 feet max, multi-wire cable supplied with Concentrator  
Digital Control Data: RS-422, 4-wire plus shield, 9-pin 'D' Connector Communication line. Remoteable 2000 ft. (600 meters between control panel and signal system)

### CONTROL SYSTEM

Detachable keyboard with 3-axis joystick	Remote data display output (non-synchronous)
9-inch CRT for data display	GPI Trigger Input
Mini-floppy disk drive for effect archiving	Serial Control—ACE Interface

### POWER CONSUMPTION

110-120 VAC, 60 Hz or 220-240, 50 Hz— single phase

Signal System: 1700W

Control System: 100 W

### PHYSICAL

Signal System Chassis:

Dimensions: 22.72" (58 cm) H x 17.5" (44.5 cm) W x 22" (55.9 cm) D  
Weight: 200 lb (90 kg.)  
Can be mounted in 19" equipment rack or free-standing as a tabletop unit

Control System:

Monitor Housing contains 9" CRT and mini-floppy disk drive  
Dimensions: 11.75" (30 cm) H x 15.25" (39 cm) W x 14.5" (37 cm) D  
Weight: 30 lb (13.5 kg.)  
Keyboard:  
Dimensions: 3.25" (8 cm) H x 15.25" (39 cm) W x 7.75" (20 cm) D  
Weight: 8 lb (3.6 kg.)

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# AMPEX



# ADO

## COMBINER WITH 3D KEYER OPTION

### General

The ADO™ Combiner is a multichannel digital combiner/keyer system capable of combining the outputs of up to four channels of ADO 1000 or ADO 2000 digital special effects. Digital video and key information from each channel are routed through the Combiner, where the operator has complete control over channel priorities. A single digitally combined image is directed from the Combiner back to each of the ADO channels for final video output. No external patching, and no system timing adjustments are required!

With the installation of the optional 3D keying feature, effect creativity is enhanced by allowing the operator to program intersecting picture planes. Digi-Matte™ key channel and Digi-Trail™ framestore effects are fully supported by the 3D keyer option, allowing stunning new effects possibilities such as a ghost-

ly image passing through a "solid" wall for example!

Because separate signals from up to four channels are combined into a single video and key output, only one input into a switcher — *and only one keyer in the switcher* — is required for even the most complex effects. And because all combining and keying are done in the digital domain, the results are clean, precise, and endlessly repeatable.

### System Description

The Combiner and 3D keyer are options for all ADO 1000 and ADO 2000 systems, and are available in two- and four-channel configurations. The Combiner connects easily to existing ADO systems via special digital cables provided with the system.

At the heart of the ADO Combiner are its unity gain digital keyers. Digital linear keying means

that soft edges stay soft, and that truly convincing solid, textured or semi-transparent keys can be composited layer after layer.

Because the Combiner uses signals derived directly from the digital processing section of each ADO system, existing ADO channel inputs and outputs are unaffected. So whether a channel is equipped for composite analog, component analog, or CCIR-601 digital operation, system timing and interconnection with the rest of your video production system won't need readjustment every time the Combiner is used.

### ADO Combiner Features

*Smooth Digital Keying:* The Combiner uses true unity gain linear keyers. Hard key edges consistently line up without timing adjustments, and soft key edges and textured keys are faithfully reproduced.





**Auto-Priority:** Channel priorities can be set manually, or be selected to automatically adjust based on channel position in 3D space. A real timesaver when you are building tricky effects.

**Dynamic Reconfiguration:** The ADO Combiner may be delegated among several ADO 1000 and ADO 2000 channels. For example, with a four channel system, one operator can digitally combine two or three channels while an operator in another studio uses a single channel.

**Optional 3D Intersecting Keyers:** The optional 3D keyer circuits permit true picture plane intersection based on channel 3D depth values.

Digi-Matte and Digi-Trail options are fully supported, allowing

irregular and complex layered images to be intersected. A background mask plane is also provided, allowing images to disappear from view. For four channel systems a second 3D keyer circuit is available, permitting four way picture intersection.

## Applications

**Live Production:** The ADO Combiner allows up to four channels to be recalled to air using only one keyer and one input to your production switcher. Fewer switcher inputs and keyers are required, and by simplifying effect recall, the potential for costly on-air errors is minimized.

**Post Production:** The Combiner's ease of use, and autopriority function and optional 3D keyers make complex multichannel effects faster to achieve, while tying up less of your post-production switcher.

**Graphics:** The Combiner's unity gain digital linear keyers, capable of faithfully reproducing key textures and transparency, in conjunction with the Digi-Matte key channel, Digi-Trail framestore and Combiner 3D picture intersection options make ADO 1000 and ADO 2000 systems the perfect devices for compositing multilayered live and graphics images.

## Specifications

Dimensions:	22.72" high × 17.5" wide × 22" deep 58cm × 44.5cm × 55.9cm
Weight:	200 lbs (90.9 kg.)
Voltage:	110-120 VAC, 60 Hz or 220-240, 50 Hz — single phase 1800W maximum

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# AMPEX



# ADO

## CONCENTRATOR WITH INFINITY™ MULTI-CHANNEL EFFECTS PACKAGE FOR ADO 3000

### General

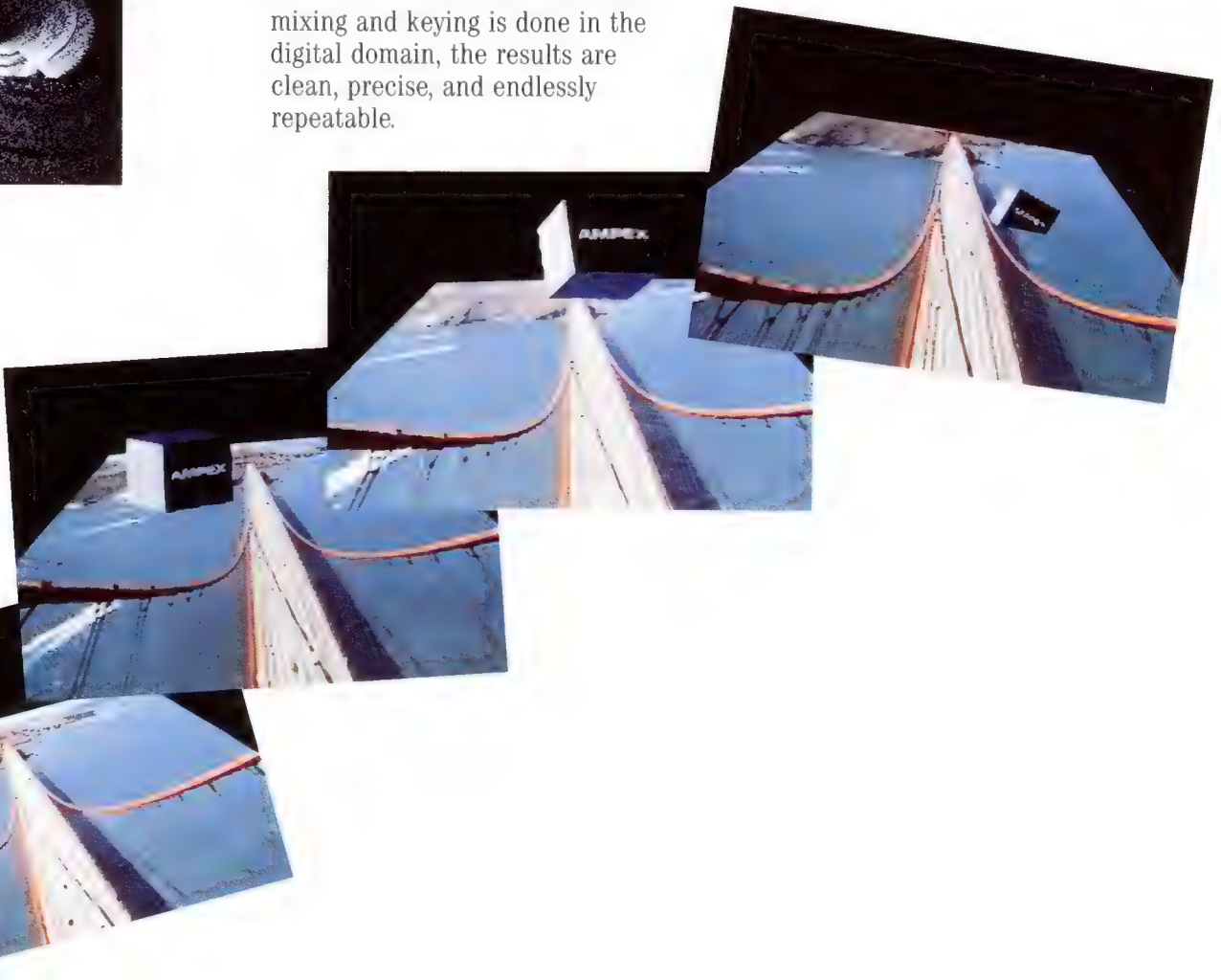
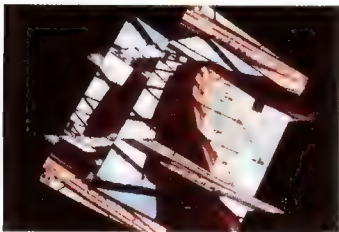
The ADO™ Concentrator is a digital mixer/keyer capable of combining the outputs of up to four channels of ADO digital special effects. Digital video and key information from each channel is routed through the Concentrator, where the operator has complete control over signal mixing and channel priorities. The Infinity™ effects package included as a standard feature of the Concentrator even allows

you to pass planes, frames, and solids through each other, while the full range of other ADO effects is simultaneously incorporated into each channel's separate image.

A single digitally combined image, including any of the unique Infinity effects that may have been added, is directed from the Concentrator to each of the ADO channels for final composite conversion. No external patching, and no system timing adjustments are required! With the ADO Concentrator, separate video and key signals from up to four channels are combined into a single video and key output. That means only one input into a switcher — *and only one keyer in the switcher* — is required for even the most complex multi-channel effects. And because all mixing and keying is done in the digital domain, the results are clean, precise, and endlessly repeatable.

### System Description

The Concentrator is an option for ADO 3000 systems and is available in two- and four-channel configurations. It connects easily to any existing ADO 3000 system, and requires no changes to units with current software. Because the Concentrator uses signals derived directly from the digital processing section of each ADO system, existing ADO inputs and outputs are unaffected. So whether a channel is equipped for composite or component analog, or CCIR-601 digital input/output, system timing and interconnection with the rest of your video production system won't need readjustment every time the Concentrator is used.





*Post-Production:* Post-production professionals consider the Concentrator's Infinity effects package to be the most innovative effects tool available for any digital effects system. The Infinity package provides the means to produce the award-winning effects post-production customers demand.

*Graphics:* The Concentrator's unity gain linear keyers and Infinity effects capabilities make it the perfect device for compositing multi-layered graphics. The 3-D key is especially useful in the creation of imaginative graphics while the target framestores make multi-layered composition faster and easier than ever.

At the heart of the ADO Concentrator are its unity gain digital keyers. Digital linear keying means that soft edges stay soft, and that truly convincing keys can be added layer after layer. Transparency/opacity of each channel is variable, and an independent matte generator is provided for keying the combined images over colored backgrounds. Each channel can be independently dimmed manually, and a programmable light source is provided to add an illusion of depth to your effects.

Infinity hardware and software for the Concentrator adds capabilities for 3-D keying. Infinity's 3-D keying prioritizes and positions all the pixels of two or more channels in three-dimensional space. By managing channel priorities in X, Y, and Z space, it allows you to pass planes, frames, and solids right through each other, to achieve results that previously could only have been done on film.

Infinity also includes two *fully independent* target framestores for adding multi-freeze effects, trails, smears and sparkles—with or without decay. Like all Concentrator resources, these target framestores can be dynamically reconfigured, delegated among separate channels, and simultaneously used by different operators.

## **ADO Concentrator Features**

*Smooth Digital Keying:* The Concentrator uses true unity gain digital linear keyers. Hard key edges consistently line up without timing adjustments, and soft key edges are beautifully reproduced.

*Auto Priority:* Channel priorities can be set manually, or automatically positioned properly in 3-D space. A real timesaver when you're building tricky effects.

*Variable Transparency:* Variable from opaque to invisible. Allows quick digital dissolves programmed right into the effect, or unique multi-layered effect to be built up using the target framestores.

*Variable Dimness:* Allows controlled dimming of any channel from full intensity down to the Concentrator matte background.

*Variable Light Source:* Permits automatic control of the intensity of each channel based on its 3-D relationship to a fixed light source. Controls for intensity of ambient and point sources are provided.

*Background Generator:* A separate background generator (2 background generators in the 4-channel configuration) is provided so the combined output may be keyed over black or any other color.

## **Infinity Effects Package Features**

*3-D Keying:* Simple to use, the 3-D keyers allow adjustable softness at the line of intersection between planes. For four-channel systems, two 3-D keyers are provided to allow two operators to simultaneously work with two intersecting planes of video.

*Trails, Sparkles, and Smears:* Complete control is provided over all aspects of trail creation. Adjustments include motion type, length, color, size, decay rate, and activity of sparkles. Multiple channels can share the same trail type, and full control over priorities of trails and channels is included.

*Drops and Clears:* Infinity target framestores enable a limitless range of multi-freeze effects. Pic-

tures can be "dropped" into the framestore in any position at any point in an effect. Frozen video can be used to create innovative effects in 3-D space such as cones and cylinders.

*Dynamic Reconfiguration:* All ADO Concentrator and Infinity resources, including linear keyers, 3-D keyers, and target framestores, can be delegated among several channels. One operator using four channels can use both 3-D keyers and target framestores, or two operators with two channels each can use one 3-D keyer and target framestore.

## **Applications**

*Live Production:* The ADO Concentrator allows up to four channels to be recalled to air using only one keyer and one input to your production switcher. By simplifying effect recall, the potential for costly on-air errors is minimized.

*Post-Production:* Post-production professionals consider the Concentrator's Infinity effects package to be the most innovative effects tool available for any digital effects system. The Infinity package provides the means to produce the award-winning effects post-production customers demand.

*Graphics:* The Concentrator's unity gain linear keyers and Infinity effects capabilities make it the perfect device for compositing multi-layered graphics. The 3-D key is especially useful in the creation of imaginative graphics while the target framestores make multi-layered composition faster and easier than ever.

## **Specifications:**

Dimensions: 22.72" high × 17.5" wide × 22" deep  
58cm × 44.5cm × 55.9 cm  
Weight: 200lbs (90.9 kg)  
Voltage: 110-120VAC, 60Hz or 220-240, 50Hz-single phase, 2100 W Max.



# ADO<sup>TM</sup>

## DIGIMATTE<sup>TM</sup> KEY SIGNAL EFFECTS PROCESSOR FOR ADO 1000, 2000 AND 3000

### General:

Before the introduction of the DigiMatte option, manipulating detailed key signals on a single channel system presented significant problems. Key effects involving anything more than a rectangular raster required either multiple channels, or matte reels.

The DigiMatte option solves this problem by providing a separate channel of dedicated processing specifically for black-and-white key signals.

The key input fed to an ADO system is simultaneously manipulated through three dimensional space in exactly the same way as the video input.

When they're both fed back to a switcher or to a Combiner/Concentrator the DigiMatte key output and video output are precisely aligned for keying.

With its full 8-bit resolution, DigiMatte processing can be used to manipulate the detailed key outputs of paint systems or the soft-edged signals from specialized keyers like Ampex Spectrakey<sup>TM</sup> or an Ultimatte\* system.

Such faithful key reproduction is especially important to achieving quality results from a linear keyer.

Key edges can be softened for more natural looking effects. And position can be controlled with a resolution of four nanoseconds.

One major feature of the DigiMatte processor is its ability to handle out-of-time inputs. Timing differences usually exist between video sources and key sources. Even in a two channel system, every time the second channel is used for key processing, it must be retimed. And this can be time-consuming.

With the DigiMatte processor, retiming of the key or video sources is eliminated, giving you more time to concentrate on your work.

If high level effects involving complex keys are part of your productions, nothing makes them easier than a DigiMatte key processor.





## System Description:

The DigiMatte option is a key channel processor. It provides a separate dedicated key input for manipulating key signals alongside the primary video signals. The DigiMatte key output can be precisely aligned with your video output—even if the inputs are out-of-time.

The DigiMatte option consists of two boards that are easily field-installed in your ADO 1000, 2000 or 3000 system.

## Features:

- ▮ Full 8-bit sampling
- ▮ Accurate key edge reproduction
- ▮ Accurate reproduction of the full range of gray for smooth linear keys
- ▮ A and B inputs
- ▮ 4 nanosecond positional resolution
- ▮ Independent key cropping
- ▮ Independent key gain
- ▮ Independent subject/background key invert

## Applications:

On-air—The DigiMatte option allows you to create “flying logo” key effects with only one channel or to position moving video inside your switcher wipe patterns.

The DigiMatte processor increases the versatility of your character generator by letting you position and freeze characters from one font, then add additional characters to your graphic from another font.

Post-production—By giving you the ability to reposition chroma-keyed images and layer keyed objects without raster boundaries, the DigiMatte key processor gives you a whole new set of creative possibilities to explore.

Graphics—The DigiMatte option provides an excellent means for handling linear keys from paint systems; and for positioning your graphics.

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**AMPEX**

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Audio-Video Systems Division

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# ADO

## DIGI-TRAIL™ TARGET FRAMESTORE

### General

The Digi-Trail Target Framestore is an optional hardware and software kit which enhances the creative flexibility of an ADO™ 1000 or 2000 system. With it, a user can create various types of trails and sparkles behind moving images, or "smear" motion within live video. The Digi-Trail kit also provides a matte generator for internally keying ADO images over colored backgrounds. Trails and sparkles can even be different colors than ADO borders. Its unique composite mode gives the user separate access to the high-quality internal framestore. With composite mode, ADO images can be internally keyed over stored backgrounds, and multi-level graphics can be easily built using the unmatched positioning capabilities of the ADO system.

### System Description

A Digi-Trail kit consists of two printed wiring assemblies (PWAs) that can be field retrofitted to new or existing ADO 1000 and ADO 2000 signal system chassis. For ADO 1000 systems, installation consists simply of adding the two PWAs and a soft-

ware update. The same is true of recent ADO 2000 units, but certain units require a hardware update. (Consult your Ampex Sales Engineer for details.)

The Digi-Trail kit adds high-quality video and key framestores and a second color matte generator to a single ADO channel. Digi-Trail processing is entirely *downstream* of ADO processing; all ADO features, including colored borders, Digi-Matte™ key processing and soft key edges, can be used with the Digi-Trail option. Digi-Trail processing is *upstream* of the ADO Combiner digital ports, so images with trails or sparkles can be digitally combined with proper priorities.

Software control provides the operator with a number of options for writing video information to the framestore. Software also controls digital combining of signals from the primary ADO channel, the Digi-Trail video framestore, and the matte generator. The same menu-driven soft keys which control the rest of the ADO System are also used to control Digi-Trail parameters.

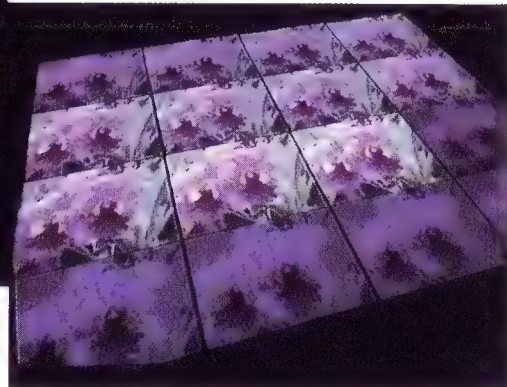
### Features

The Digi-Trail Target Framestore offers a number of new and unique features, including:

- ☐ Trail — A smooth trail of decaying video or color matte is left behind the image being manipulated by the ADO channel.
- ☐ Sparkles — The trail left behind a moving image decays in a random pattern of video or color matte sparkles.
- ☐ Motion Smear — Any motion resulting from ADO manipulations, or from motion in live video, is "smeared."
- ☐ Chroma Fade — The chroma values of a created trail can fade or sparkle down to null.
- ☐ Variable Decay — Decay time parameters affecting trails, sparkles, smears, and chroma fade are independently variable from instantaneous to infinite, allowing the operator precise control over the design of the effects.
- ☐ Centipede — Trails can be made to persist on the screen for a precise period of time, such that they lag behind the moving video by a fixed distance.



With the Digi-Trail option, a wide variety of trails — including colored sparkles — are easily created.



Fields or frames of video can be "dropped" onto the Digi-Trail in any position, where they can fade at any rate.



- ☐ **Variable Color Matte Background** — An additional matte generator in Digi-Trail allows ADO borders to be used over a colored background. External keyers and matte generators are not tied up.
- ☐ **Picture Drop** — ADO images can be selectively “dropped” onto the DigiTrail framestore contents in any position and at any point in an ADO timeline, enabling a wide range of multi-freeze effects.
- ☐ **Composite Mode** — The unique Digi-Trail Composite Mode allows an ADO image to be internally keyed over any frame previously stored in the framestore.
- ☐ **Layering** — Successive ADO manipulations can be moved or positioned on top of the framestore, then dropped at the touch of a button, allowing instant composite layering of graphic images.
- ☐ **Reveal** — Trails or sparkles can be used to reveal any video image previously stored in the Digi-Trail framestore. Trails are easily colored, or entire frames of video can be revealed.

- ☐ **Multi-Freeze** — Any combination of successive picture freezes can be programmed, at any rate and in any position on the screen.
- ☐ **Field or Frame Mode** — The Digi-Trail framestore can be updated every field or every frame, eliminating the common problem of flicker normally associated with video trails.
- ☐ **Internal or External Keying** — Digi-Trail selections allow the ADO channel to output self-keyed trails and sparkles, or alternately to output separate key and video signals for use with an external keyer.

### **Applications**

The Digi-Trail Target Framestore enhances the utility of ADO systems in a wide variety of applications, including:

Post-Production — Digi-Trail effects emphasize motion, whether the motion is moving video or picture manipulation. With the Digi-Trail option, a user can add visual impact to productions that clients will readily perceive, whether the effect is a

subtle highlighting of moving picture elements, a dramatic zoom-in on a title key, or a dynamic transition between show segments.

The Digi-Trail Target Framestore enhances the utility of ADO systems in a wide variety of applications, including:

Broadcast — Digi-Trail opens a new range of creative possibilities that add sparkle to your on-air appearance. Use reveal mode to uncover a city skyline with a tumbling logo, or motion smear to blur the video behind sports scores or graphic titles.

Graphics — When combined with the realistic picture manipulation of ADO rotation and perspective and the unequalled key channel capabilities of the Digi-Matte™ option, a Digi-Trail kit can turn your ADO system into an even more flexible tool for producing video graphics. The unique Digi-Trail composite mode provides a simple means of compositing multi-layered graphics with the flexibility and speed of ADO.



# ADO™

## CONTROL SYSTEM ENHANCEMENT PACKAGE

FOR ADO 1000, 2000, & 3000

### General

The ADO™ Control System Enhancement Package consists of an enhanced keyboard, expanded ADO software and a unique off-line effects management system.

The new keyboard offers fast, easy and accurate access to all menus and instantaneous access to the most often used ADO functions. Soft key menus are limited to a maximum of two levels in any given mode, with critical or commonly used functions now accessed via dedicated hard keys on the keyboard itself.

### System Enhancements

Functions transferred to instantaneous keyboard access include:

Insert	Adds keyframe in Program mode
Delete	Deletes keyframe in Program mode
Motion Type	Calls up Motion Control menu
Key Control	Calls up Key Control Flags menu
K F Flags	Calls up Keyframe Flags menu
I V Params	Calls up Input Video Parameters menu

D T or F S Params	Calls up Digi-Trail™ (1000/2000) or Infinity™ Framestore (3000) Parameters menu
On-Air	Calls up the On-Air mode (1000/2000)
Conc	Calls up the Concentrator menu (3000)

### New Features Include:

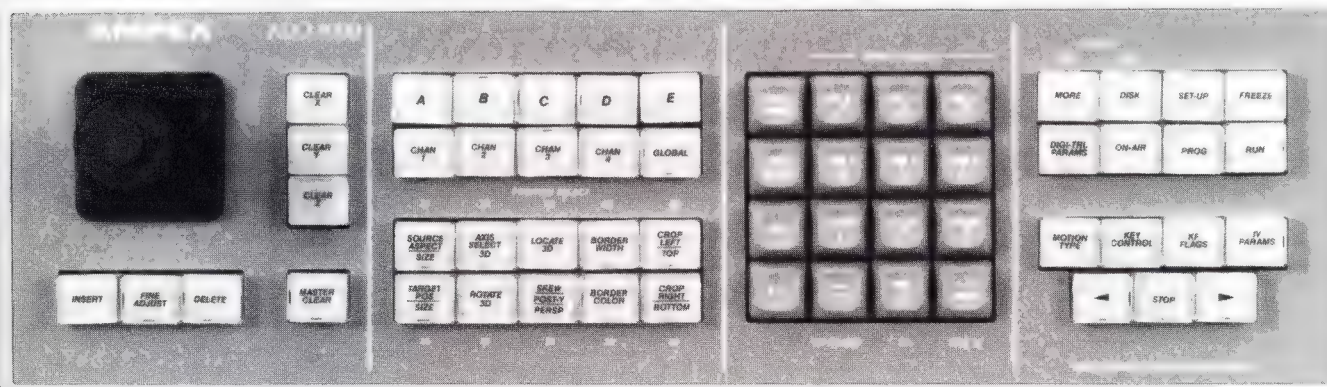
**Fine Adjust** — A new function accessed from a hard key located directly below the joystick. This toggles the joystick from normal to fine range adjustment, allowing the user greater tactile control for subtle keyframe modifications.

**Add Keyframe in Run Mode** — This feature allows the user to insert a keyframe while in run mode. The new keyframe will replicate all the parameter values of the current picture position, without altering any parameters in the overall effect, including motion path and total effect time. Having added the keyframe, the user may go into the Program mode to modify the keyframe as desired.

**Digital I/O Interface** — The Enhancement Package software includes an interface to the optional ADO Digital Interface, allowing operator control over the Digital I/O matrix. The user may select digital or analog video or key inputs on a keyframe-by-keyframe basis in the Program mode. Two 4:2:2 digital inputs and two analog inputs are available; all inputs are operator-programmable in any combination and switchable in any keyframe. There is no limit to source switches within an effect.

**GPI Control** — The operator-controlled programmable GPI menu allows the user to assign the functions of the three GPI inputs from the keyboard. The new software expands the GPI interface beyond the standard run forward, run backward and freeze functions to a full range of functions, including jog, channel ID, go next and independent channel-by-channel freezes.

**Warp Factor Flag** — This flag has been added to the Input Video Flags submenu to facilitate Warp control. While Warp capabilities are not new





to ADO systems, the Warp Factor flag enables a much greater degree of operator control over the warps. Page turns, twists, flag waves and other effects are easily created and modified using the Warp Factor flag.

**Layering Mode**—With the ADO Digi-Trail option installed, a new layering mode is available from the Program menu, facilitating creation of a multi-layered composition in the Digi-Trail target framestore. Dropping successive images into the framestore requires only one key-stroke in this mode with the joystick used to reposition the image for the next drop or layer. This allows the user to create complex composite graphics, such as charts and graphs, as well as build multi-layer images, such as logos and bumpers, all in a single generation.

**Storing Effects in Control Panel Memory**—Similar to the current keyframe memory on the control panel, this feature allows temporary storage of an entire effect, including local and global keyframes, timeline and priority settings.

**Chroma Kill**—Allows the user to force monochrome, rendering the video output video black-and-white. The Kill is keyframe-programmable and can be effected either full-frame or inside or outside a window.

**Pick/Put Register**—Allows the user to store a numeric value in a "pick" register, which can then be "put" in any keyframe, any parameter, any axis, any number of times with two simple keystrokes on the numeric

keypad. The "picked" value remains available in the register until cleared or replaced with a new value.

**Disk**—A new hard key and a new ADO mode, this function reorganizes on-line disk-related operations into one area, allowing the user direct access to virtually all of the disk management functions, including list directory, copy disk, erase effect, enter name and format disk.

### Off-Line Effects Management System

Designed for use on an IBM PC, this ADO file management system greatly simplifies effects list management, maintenance and library functions.

Using a standard IBM PC, ADO disks, as well as individual effects, may be listed, copied, merged and erased off-line. Single effects or entire disks may be stored on the IBM hard disk for centralized archival storage and quick, easy retrieval. Fast, simple creation of customized effects disks becomes standard operating procedure for the ADO owner.

### System Description

The Enhancement Package is a logical extension of the original ADO keyboard. The new hard keys, location changes and enhanced capabilities are easy to learn for both the experienced and the occasional ADO operator. The unique, optional ADO Training Package that helps new users master the ADO system has been updated to support the Enhancement Package.

The Enhancement Package can be easily integrated into any configuration of ADOs—single or multiple channels and single or multiple control stations. A multiple control station facility can have any combination of original and Enhanced keyboards.

The Off-Line Effects Management System only requires access to a standard IBM PC, and will accept and manipulate ADO disks created on any version of ADO software.

Enhancement installation is simple: unplug the old keyboard, plug in the new keyboard, install the software in the system, power up and fly!

### Specifications

Applications:	To upgrade ADO systems using software released prior to Version 9.2 (ADO 1000/2000) or Version 10.0 (ADO 3000).
Keyboard Dimensions:	3.25" H × 17" W × 7" D
Mounting Options:	Tabletop Flush with console surface Raised above console surface (All required mounting hardware included)
Off-line Effects Management System:	360K 5 1/4" floppy diskette Runs under PC/DOS Version 3.1 or higher

Specifications subject to change with notice or obligation.

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**AMPEX**



# ADO

## ACCESSORIES

### Control Panel Processor (CPP)

The ADO™ CPP is an intelligent control device which includes keyboard, disk drive, and menu display. Up to eight ADO Control Panel Processors may be used with the ADO system. Software control at each CPP allows users to acquire free ADO channels, and retune signal systems right from the CPP keyboard, making timesharing of resources easy. Each CPP may be located as far as 2000 feet from the signal system or Hub Box. (To add additional CPPs either the Hub Box or the Interconnect Box is required.)



### Hub Box

The ADO Hub Box is an active buffer and line isolator for ADO communication lines. Multichannel control cables from up to four ADO Control Panel Processors can be connected to the Hub Box, which has control outputs for up to four signal systems and an ADO Combiner or Concentrator. Two Hub Boxes may be slaved together, allowing interconnection of up to eight CPPs. Active line drivers in the Hub Box allow each cable run to and from CPP's and signal systems to be the maximum (2000 feet) length.

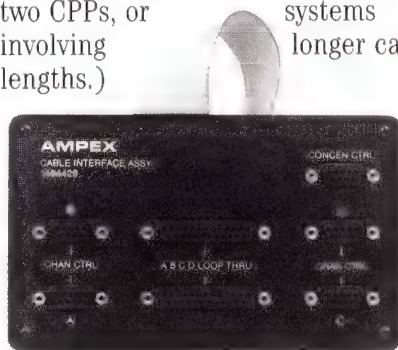


### Digital Test Signal Generator

The ADO Digital Test Signal Generator is a precision tool for aligning and troubleshooting ADO signal systems. It generates accurate digital test patterns for aligning output D/A circuitry independent of input A/D circuitry. After output D/As are aligned, input A/Ds can then also be adjusted to optimize video performance throughout the ADO signal path.

### Interconnect Box

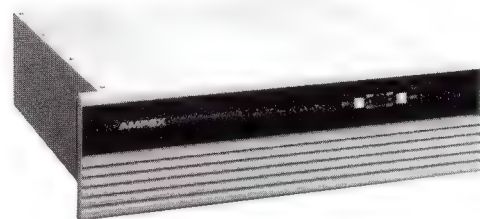
The ADO Interconnect Box is a passive hardware assembly required for multichannel installation whenever a Hub Box is not used. The Interconnect Box allows daisy chain interconnection between control panels in multiple CPP installations. One Interconnect Box is required for each CPP. (The Hub Box is recommended for systems with more than two CPPs, or systems involving longer cable lengths.)



### Digital Interface

The ADO Digital Interface is a stand-alone unit which provides CCIR-601 (4:2:2) compatible digital video and key inputs and outputs directly to and from the digital processing of existing ADO signal systems. Once installed, switches allow the operator to select between digital and analog inputs, while both digital and analog outputs remain active. Can be used with all other options, including the ADO Component Kit, Combiner, and Concentrator.

options, including the ADO Component Kit, Combiner, and Concentrator.



### Component Kit

The ADO Component Kit adds RGB or Y, R-Y, B-Y (YUV) input and output capabilities to existing composite ADO signal systems. Jumper selections enable any combination of RGB, YUV, or composite input and output configurations. Can be added to any existing ADO 1000, ADO 2000 or ADO 3000, including systems with Combiners or Concentrators, and the Digital Interface.

### ADO 1000/2000 Operator's Training Package

The ADO Training Package is a self-directed interactive training tool designed to bring any ADO operator, regardless of experience, to a high degree of comfort with ADO programming techniques. Exercises are developed in six modules using audio tapes, ADO effects disks, an example VHS video tape, and a workbook. Extra workbooks may be ordered for additional students.





## **Ampex Service and Support**

A wide range of Ampex support services are available to insure that you continue to get the most from your ADO system. From initial installation check-out and training to spare parts kits, our board exchange program, and comprehensive operations and maintenance training classes, Ampex Customer Services continue to add value to your ADO system long after the sales contract is signed. For more information about Ampex Customer Services, contact your Ampex Sales Engineer or Authorized Ampex Dealer.

## **Other Accessories:**

Digi-Matte™ Key Processor  
Digi-Trail™ Target Framestore  
AVC Style Keyboards  
Combiner  
Concentrator with Infinity™  
Control System Enhancement Package  
Conversion Kits  
Spare Parts Kits

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# ADO<sup>TM</sup>

## DIGITAL INTERFACE

### General

The ADO<sup>TM</sup> Digital Interface is an optional accessory which expands the system flexibility of new and existing ADO units by providing SMPTE/EBU standard component digital input/output ports. With the Digital Interface, any ADO system can be directly connected with other CCIR-601 equipment. Examples are graphics production and storage devices, and component digital tape transports. The Digital Interface allows the user to take full advantage of the superb ADO effects capabilities while maintaining degradation-free signal interchange.

### System Description

The ADO Digital Interface consists of a free-standing, self-contained unit which connects to any ADO signal system through existing multi-pin connectors on the back of the chassis. These connectors feed directly to the ADO digital processing sections, so that all analog processing can be bypassed when the Digital Interface is used. (See system diagram.)

When connected to a Digital Interface, the analog outputs on the back of the ADO signal chassis remain active. This means that digital inputs to the ADO system can be processed, then output in analog form for monitoring or other purposes, at the same time that they are being passed digitally to other studio equipment for further processing.

The two video inputs to ADO are independently switchable between the analog inputs supplied to the standard ADO chassis, and the digital inputs supplied to the Digital Interface. These switches are located at the front panel, and can be controlled remotely by a GPI contact closure if desired.

The Digital Interface can also work in conjunction with the optional ADO Component Kit. Analog inputs and/or outputs may be either component or composite. Since a variety of signals can be input and output in many combinations, an ADO system can be readily integrated into virtually any application.

The ADO Digital Interface Kit works with all ADO 3000, 2000, or 1000 systems. In multiple channel configurations, a separate Digital Interface is used for each signal system requiring digital input/output. Digital interconnection to an ADO Concentrator or Combiner is independent of the interconnection with the Digital Interface.

### Features

The ADO Digital Interface offers a number of useful features, including:

- ☐ Easy Installation — *No changes*, either hardware or software, are required for most existing ADO systems. Simply connect the provided cables to existing plugs on the ADO chassis. (PAL systems and some ADO 2000 systems require a minor modification. Consult your Ampex Sales Engineer.)
- ☐ Switchable Digital/Analog Video Inputs — The A and B video inputs to the ADO chassis are independently switchable from analog to digital, allowing quick source





changes and maximum system flexibility.

- ☐ GPI Switch Input — The digital/analog switches are controlled either from the front panel of the ADO Digital Interface, or through a standard GPI connector, to allow source changes to be controlled remotely.

- ☐ Uninterrupted Analog and Digital Outputs — Both the CCIR-601 digital outputs from the Digital Interface and the standard analog outputs on the back of the ADO chassis remain active at all times, regardless of the source selected, so system configuration is greatly simplified.

- ☐ Complete System Flexibility — The ADO Digital Interface works with system configurations that include the ADO Combiner or Concentrator. Digital signals are supplied to the Combiner or Concentrator, and the combined output is made available at the digital video port.

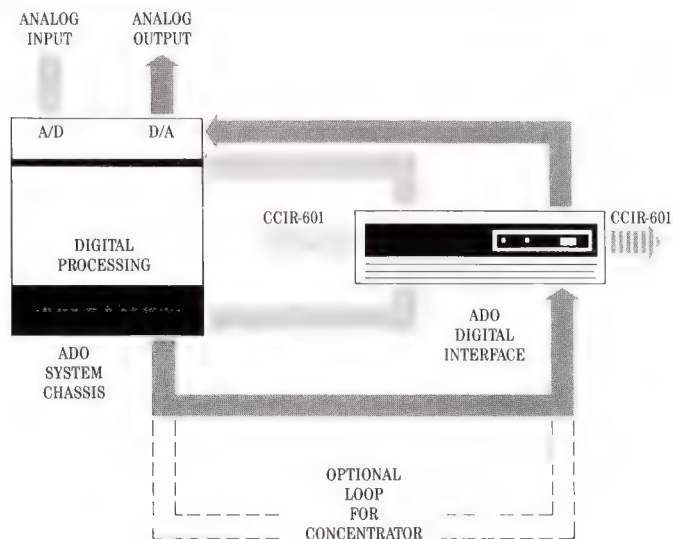
- ☐ Video Present Indicator Lamps — The presence of video is indicated by separate LEDs for the A and B inputs.

- ☐ Digital Test Signal Generator — The ADO Digital Interface also provides a test signal generator which helps maintain precise alignment of the ADO analog and digital sections, as well as peripheral devices.

- ☐ Digital Reference Input — For all digital environments, input circuitry and an additional connector are available for a digital reference input.

## Specifications

Video Input	Two CCIR-601 Standard 25-pin connectors (for A and B Video Inputs)
Key Input	Two CCIR-601 Standard 25-pin connectors (for A and B Key Inputs)
Video Output	Two CCIR-601 Standard 25-pin connector for Video Output
Key Output	One CCIR-601 Standard 25-pin connector for Key Output
Interface Hardware	Four 3-ft. cables provided for connection with existing ADO channels. Optional longer cables are available.
Signal Characteristics	Conforms to CCIR-601 Component Digital Standard (either 525/60 or 625/50, jumper selectable)
Front Panel Controls	"A" Video/Key Select (Analog/Digital) "B" Video/Key Select (Analog/Digital) Power on/off
Physical Dimension	Size: . . . . . 5.25" High x 19" Wide x 20" Deep (133x482x508 mm) Weight: . . . . . 30 lbs. (13.6 kg.) Mounting: . . . . . 19" EIA Rack
Power	Frequency: . . . . . 50/60 Hz, single phase Input Voltages: . . . . . 90-132/180-264 VAC Consumption: . . . . . 230 Watts Max.
Environmental	Temperature: . . 0° to +40° C (+32 to +104° F) Humidity: . . . . . 10-90% RH Meets FCC Class A Spec for RFI/EMI Interference



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Audio-Video Systems Division

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# DIGI-LOOP SYSTEMS

## ADO 2000 DIGITAL EFFECTS VISTA SERIES SWITCHERS

### Introduction

The Digi-Loop™ facility on the AVC Vista™ switcher combined with the ADO® digital effects system provides a uniquely powerful production tool at a truly affordable price. Many effects are possible with this integrated equipment combination. Usually, a much larger switcher, external patching panels, and plenty of time are required to achieve the same results. With a Vista switcher and ADO digital effects, a single button push is all it takes!

The Digi-Loop system includes either a 10- or 18-input Vista switcher, an ADO 2000 digital effects system with rotation, perspective and Digi-Matte™ key channel; and a serial interface with interconnection cable included to allow communication between the two units.

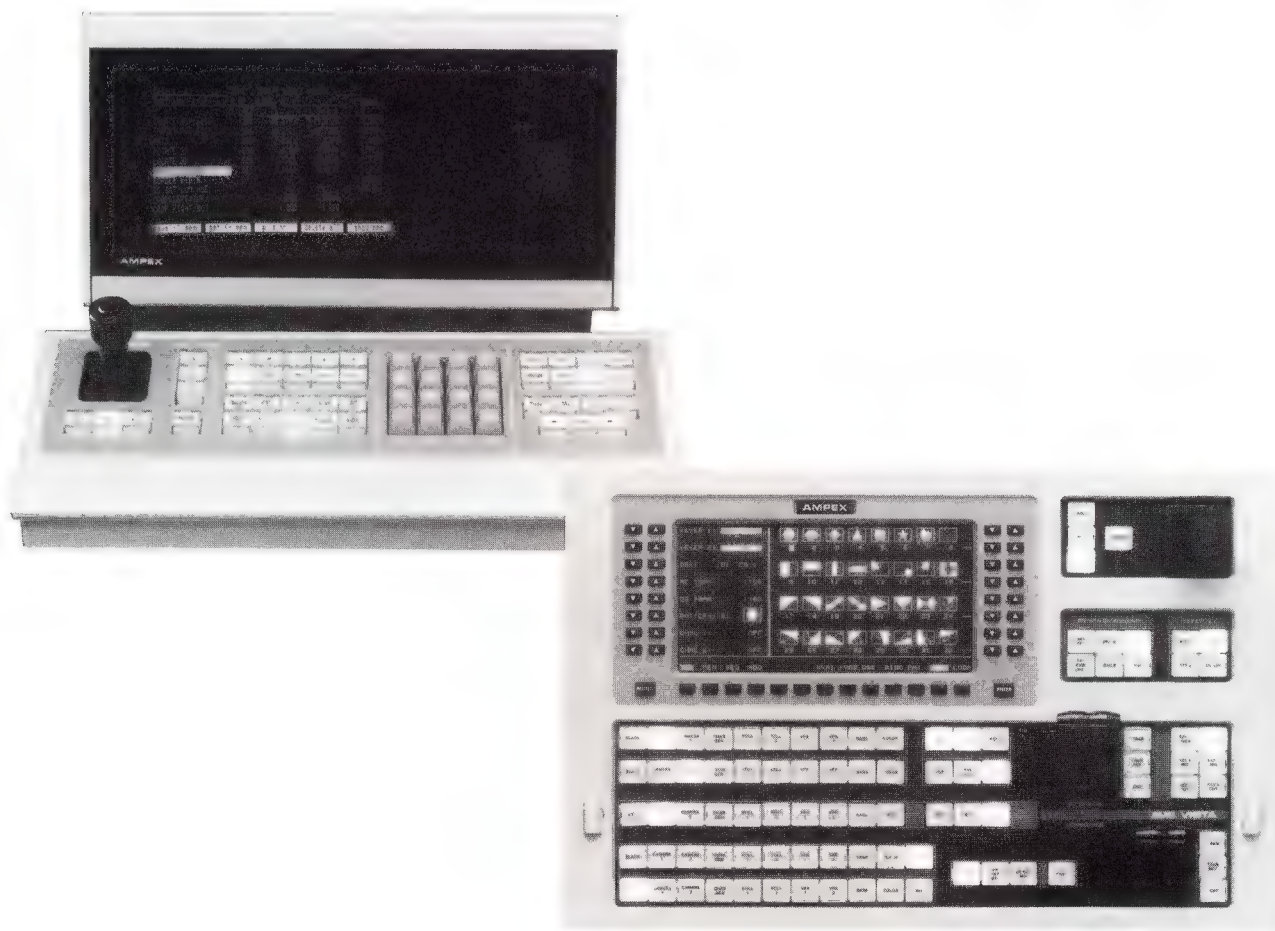
### Digi-Loop System Capabilities

The Vista switcher communicates to the ADO system via a high-speed serial link allowing remote selection, trimming, and running of an effect directly from the Vista console. All motion path, input source and video transition information may be stored in ADO and Vista memories, allowing later recall of complex effects with a single key-stroke. ADO effects can be run manually with the Vista fader bar or can be included in a complex Vista memory sequence.

With the Digi-Loop feature, the ADO system can act as an advanced digital key modifier featuring its own key mask. Functioning in this manner, it can be used to resize, position, scroll or roll titles, logos, camera artwork or any other keyed graphic. Keyed images can have per-

spective added, can be rotated in three dimensions, and can even be provided video highlights, mattes, mosaic fills and limitless other key effects. Alternatively, the ADO system can act as a pattern modifier or even an additional digital pattern generator. These wipes can range from simple box wipes to incredible "venetian blind" and twinkling star effects. They can be run simultaneously with, or independently of the standard Vista wipe patterns.

Of course, the ADO signal system can function as a conventional digital effects system, easily and accurately manipulating any primary switcher input in 3-dimensional space. The Vista switcher provides all input video routing and output keying required for up to two ADO channels via the dual channels of the Digi-Loop option.





## Digi-Loop Optional Capabilities

RGB and ISOLated key input processors can be added to the Vista switcher to provide flexible keying capability of camera, character generator and other key hole sources; the "hole cutter" signals being available to the ADO signal system via the Digi-Loop path for digital processing. By adding the Spectrakey™ option to the Vista switcher, spectacular linear chromakeys with no "blue fringing" artifacts can be created from either composite or RGB sources. The Digi-Loop feature allows even these chroma-nulled keys to be manipulated by the ADO effects system.

With the optional ADO Digi-Trail™ framestore installed, even more exciting effects and capabilities are available. These include multicolor background washes, key fills and glinting highlights on characters. Complex layered scenes can be created by stacking unlimited numbers of keyed images. Framestore contents can be painted into view and images traced into curvilinear shapes. With the Digi-Trail framestore, even simulated 2-channel effects can be accomplished in a single channel. Of course, the Digi-Trail option also creates the dynamic trails and glowing sparkles that add the punch to your production and keeps bringing clients back for more!

## Specifications

### Vista Switcher

#### VIDEO PERFORMANCE

Input return loss (ext 75 $\Omega$ terminator)	$\leq -40$ dB at subcarrier
Output return loss	$\leq -40$ dB at subcarrier
Frequency response (referenced to subcarrier)	100 kHz to 5.5 MHz: $\pm 0.2$ dB 5.5 MHz to 8.0 MHz: $+ 0.2$ dB to $-1.0$ dB Smooth rolloff above 8 MHz
Differential Gain	$\leq 0.7\%$ (10 to 90% APL)
Differential Phase	$\leq 0.7^\circ$ (10 to 90% APL)
Signal-to-Noise Ratio	$\leq 65$ dB unweighted, 10 kHz to 5 MHz
Crosstalk	$\leq 55$ dB at subcarrier

### ADO Special Effects System

#### PERFORMANCE

Luminance frequency response:	NTSC $\pm 0.5$ dB to 4.2 MHz; $+ 0.5 - 1.0$ dB to 5.0 MHz PAL $\pm 0.5$ dB to 4.5 MHz; $+ 0.5 - 1.0$ dB to 5.0 MHz
-------------------------------	---

Input video level range:  $+ 2$  dB

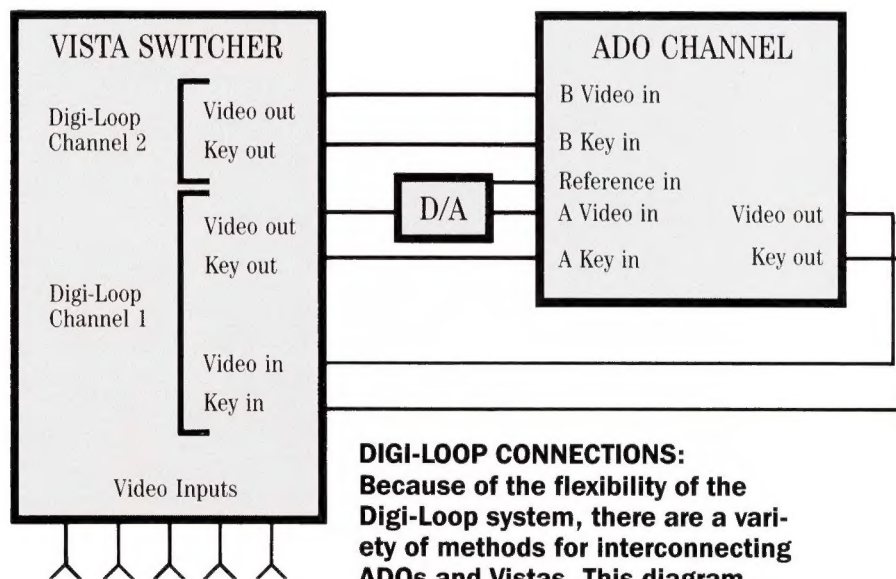
#### DIGITAL SIGNAL SAMPLING

Luminance sampling rate: 13.5 MHz

#### SIGNAL SYSTEM INTERCONNECTS

Video Inputs:	Two, BNC 75 Ohm, 1 Volt, Composite, Analog Encoded
Key Inputs:	Two, BNC 75 Ohm, Composite or Non-Composite, Analog Encoded (white or black in key hole)
Video Outputs:	Two, BNC 75 Ohm, 1 Volt, Composite, Analog Encoded
Digital Signal Data:	To Combiner: Balanced ECL Digital Data, 15 feet max, multi-wire cable supplied with Concentrator
Digital Control Data:	RS-422, 4-wire plus shield, 9-pin 'D' Connector Communication line. Remoteable 2000 ft. (600 meters between control panel and signal system)

Specifications subject to change without notice or obligation.



**DIGI-LOOP CONNECTIONS:**  
Because of the flexibility of the Digi-Loop system, there are a variety of methods for interconnecting ADOs and Vistas. This diagram shows a typical one channel hookup.

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# NEW ADO™ 1000/2000 OPERATORS

- ☐ Shorten your learning time
- ☐ Increase your effectiveness . . .

*. . . with the ADO 1000/2000 Operator Training Package from Ampex*



Now you can learn the basics of ADO operation at your own pace, on a schedule that suits *you*, with this field-tested training course.

You'll learn quickly by doing real-world exercises, using a combination of materials: workbook, audio tape, and a video tape with examples of ADO effects. In no time at all, you'll be doing professional-level image manipulation on your ADO system.

Even operators with some experience can benefit from this course, because it explains not only *how* the system works, but *why* it works that way. With this sound basis of understanding and your own creativity, you can soon be doing advanced work.

One or more operators can share course materials. Extra workbooks are available so individual operators can proceed at their own pace.

At only \$795.00 (in the U.S.A.) for the full package, the ADO Operator Training course is both an excellent investment and a bargain. Trainees don't have to travel to a distant location and lose valuable time from the job while learning the basics. Here's what some of our users say about it:

*"What it did that was particularly useful was drill into me how it works and why. I retain things better once I fully understand them, and then I'm more effective."*

*"Even having used an ADO for a few months, I learned a lot that I didn't find out on my own."*

Jim Farney, Pacific Video Resources, San Francisco

*"It's a great idea. The audio tape took me through all the basics of keyboard operations, how to get into menus, etc. And the example tape really helps you see what you're trying to do."*

*"Now I'm looking forward to an advanced course with the confidence that I know the basics. Manufacturers should have more operator training of this kind."*

Adam Swarc, Pacific Bell, San Francisco



## TEN GOOD REASONS TO OWN AN ADO SYSTEM

### **1—Award-Winning Effects**

If you have the talent to do award-winning work, you should have the best tools available.

### **2—Total Creative Control**

Your effects never have that “canned” look.

### **3—Upgradability**

There’s no such thing as an obsolete ADO system: you can start simple and expand as your needs and budget grow.

### **4—Reputation**

The effects customers ask for.

### **5—Fast and Simple Recall**

Lets you concentrate on creativity rather than keystrokes.

### **6—Advanced Engineering**

Gives you the opportunity for more innovative effects, and the best picture quality of any system available.

### **7—Digi-Matte Key Processor**

Lets you do highly detailed key effects without a matte reel or second channel, and without that “pasted-on” look.

### **8—Infinity, Digi-Trail and 3D Keyer Effects Packages**

Sophisticated effects that can give your production facility a competitive advantage—or add punch to your channel’s on-air look.

### **9—System Flexibility**

Designed to easily integrate into your existing production system.

### **10—After-the-Sale Support**

Comprehensive training, technical support and expert field service all help ensure that you get peak performance from your ADO system.

Whatever your application, there’s an ADO model designed for you. And since there’s a system that will fit almost everyone’s budget, you won’t have to settle for anything less than the best effects possible.

For more information, contact your nearest Ampex Sales Engineer or Authorized Ampex Dealer.

# AMPEX



